

Communications Troubleshooting and Testing for WaveData 900 Radios

APPLICATION NOTE / FEBRUARY 2012 / 9C0455r2

Can't Find Host Radio

1. Be sure cabling between computer and host WaveData unit is securely attached.
2. Be sure power is on to the WaveData unit. A green LED visible through the upper right corner of the WaveData box will blink when power is on.

If running on batteries:

- The power switch is on the bottom of the WaveData box. Press in firmly to activate.
- If unit has been working but has recently stopped, replace batteries with fresh batteries.

If running on auxiliary power:

- Consult specific information for your unit to be sure power is being supplied.
3. Be sure that the correct COM port is selected in Aqua4Plus. If you do not see your COM port listed, first be sure it is not in use by another application. Then be sure that Highest COM Port is set appropriately, as Aqua4Plus will not list any COM ports higher than this setting. See the Communication dialog box under the Options Menu.

Modbus Communications Options

Factory Suggested Settings
Existing Settings

Retry Level: [Slider]
Lowest Sensor Address: 1

TimeOut Level: [Slider] X10
Highest Sensor Address: 4

Highest COM port: 12
Max Packet Send: 201

☒ Enable S/F Radio Wakeup
☒ Mapped Network Scan
☐ Is Cellular Network

OK Cancel

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1. Be sure Aqua4Plus can find the Host Radio. If not, see previous section.
2. Be sure your communications options are set appropriately - Select the Communication Option on the Options Menu.
 - Be sure you have selected WaveData Radios or IP Cell Modem and Radios, if using a cellular modem.
 - Be sure that you are scanning the proper range of addresses to find each unit. Each WaveData unit and each Smart Sensor has a unique address, known as the Modbus address or Sensor address. To increase scanning speed, Aqua4Plus is often set to scan a limited number of addresses. Adjust Lowest and Highest Sensor Address as necessary.
3. Be sure the network map in the host matches your actual network layout.
4. Occasionally, Retry and TimeOut levels may need to be increased. (Options Menu, Communications options.) Retry Level is how many times Aqua4Plus tries to communicate with a remote radio or a sensor before giving up. TimeOut level is how long (in milliseconds) Aqua4Plus waits for a response from a remote radio or a sensor before retrying. If you continue to have difficulty finding remote units, increase the timeout level slightly by clicking on the indicator and dragging to the right. Note that the more retries and the higher the time outs, the longer the scan time.
5. Be sure antenna connections at both host and remote radio are secure, if using an external antenna.
6. Be sure you have a clear RF line-of-sight between the host and remote radio. (See Installation Considerations earlier in this manual.)
7. Be sure power is on to the WaveData unit. A green LED visible through the upper right corner of the WaveData box will blink when power is on.

- The power switch is on the left side of the bottom of the WaveData box. Press in firmly to activate.
- If unit has been working but has recently stopped, replace batteries with fresh batteries.

- Consult specific information for your unit to be sure power is being supplied.

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Can't Find Smart Sensors

1. Be sure Aqua4Plus can see the WaveData unit to which the sensors are attached. If not, see previous section.
2. Be sure connections from WaveData unit to sensors are secure.
3. Be sure that you are scanning the proper range of addresses to find each unit. Select the Communication Option on the Options Menu. Adjust Lowest and Highest Sensor Address as necessary.
4. Be sure the network map in the host matches your actual network layout.
5. Increase the Timeout Level slightly. (See details under section 4 of *Can't Find Remote Radio*.)

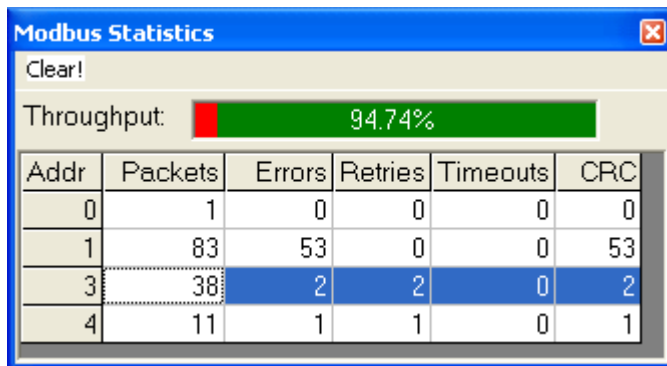
Can Find Smart Sensors But Can't Reliably Communicate

1. Increase the Retry Level and/or the Timeout Level slightly.
2. Be sure connections from WaveData unit to sensors are secure.

Testing Tools

Modbus Statistics

View Menu => Modbus Statistics



Shows communication throughput for all channels that it has been communicating with.

Click on specific address to see throughput bar for that address.

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Test Communications

Utilities Menu => Test Communications

Communication Test: 3

WARNING! Do not run "Write" tests on sensors that contain session data. Data may be erased or corrupted.

Test: Address: Retries:

Tests/Min: Size (Bytes):

Throughput: 83.33%

Results: 13 packets, 2 errors, 15.38%
406 ms/Package 156 ms/Success

Errors Results

10-Sep-09 14:39:58 *** Communications Failure ***
10-Sep-09 14:39:59 *** Communications Failure ***

Results

Time	Test	Size	Duration	Tests	Errors	Throughput	Delay
14:39:55	Read	40	0:00:09	23	2	91.30%	156

Bytes recieved while idle: 0

Run Close

Shows communication throughput on selected channel.

Shows average time for all packets and average time for successful packets.

Do not run "Write" tests without talking to INW engineering.

Can set Retries, and Byte size.

Uses timeout set in Communications box.

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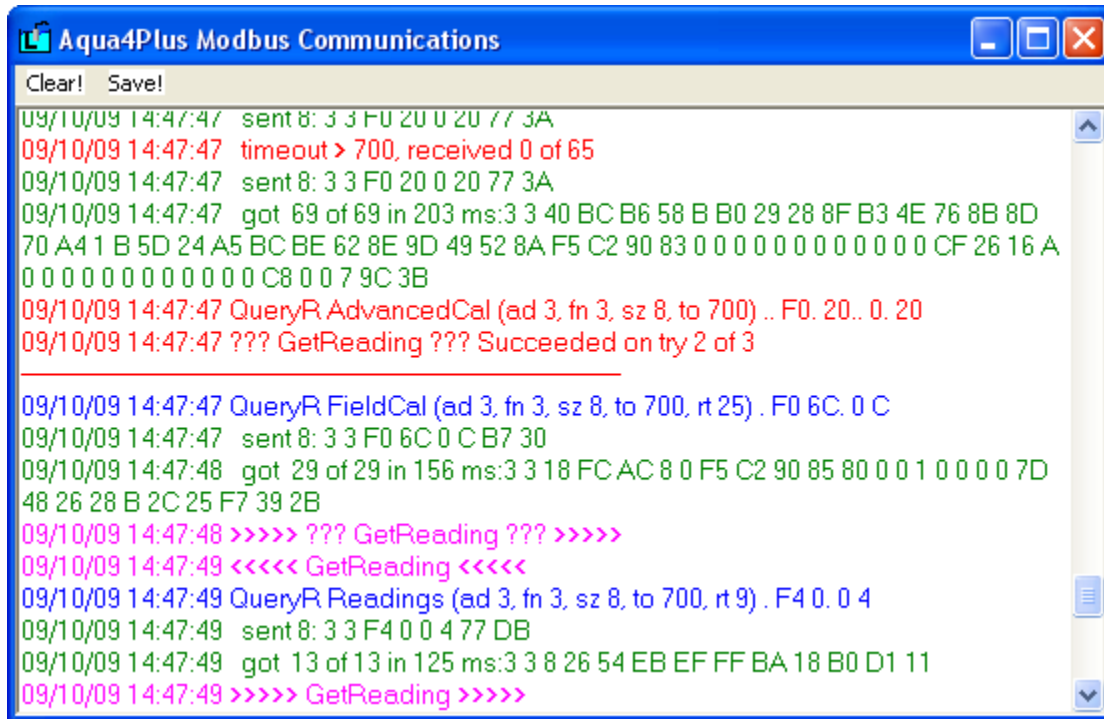
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Log File

Diagnostics Menu => Log Communications to Window

or

Hold Alt key while clicking Sensor tool button



```
09/10/09 14:47:47 sent 8: 3 3 F0 20 0 20 77 3A
09/10/09 14:47:47 timeout > 700, received 0 of 65
09/10/09 14:47:47 sent 8: 3 3 F0 20 0 20 77 3A
09/10/09 14:47:47 got 69 of 69 in 203 ms: 3 3 40 BC B6 58 B B0 29 28 8F B3 4E 76 8B 8D
70 A4 1 B 5D 24 A5 BC BE 62 8E 9D 49 52 8A F5 C2 90 83 0 0 0 0 0 0 0 0 0 0 CF 26 16 A
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 C8 0 0 7 9C 3B
09/10/09 14:47:47 QueryR AdvancedCal (ad 3, fn 3, sz 8, to 700) .. F0. 20.. 0. 20
09/10/09 14:47:47 ??? GetReading ??? Succeeded on try 2 of 3

09/10/09 14:47:47 QueryR FieldCal (ad 3, fn 3, sz 8, to 700, rt 25) . F0 6C. 0 C
09/10/09 14:47:47 sent 8: 3 3 F0 6C 0 C B7 30
09/10/09 14:47:48 got 29 of 29 in 156 ms: 3 3 18 FC AC 8 0 F5 C2 90 85 80 0 0 1 0 0 0 0 7D
48 26 28 B 2C 25 F7 39 2B
09/10/09 14:47:48 >>>> ??? GetReading ??? >>>>
09/10/09 14:47:49 <<<< GetReading <<<<
09/10/09 14:47:49 QueryR Readings (ad 3, fn 3, sz 8, to 700, rt 9) . F4 0. 0 4
09/10/09 14:47:49 sent 8: 3 3 F4 0 0 4 77 DB
09/10/09 14:47:49 got 13 of 13 in 125 ms: 3 3 8 26 54 EB EF FF BA 18 B0 D1 11
09/10/09 14:47:49 >>>> GetReading >>>>
```

Logs all communication between Aqua4Plus and sensors.

This file can be saved to disk.

This is extremely helpful to engineering when all else has failed in trouble-shooting communication problems.

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